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THE JOURNAL OF

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Volume 44 December, 1953 Number 8

THE VALUE CONCEPT IN EDUCATIONAL PSYCHOLOGY[1]

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Not long ago I asked a graduate student in social psychology what his subject teaches about value judgments. Without hesitation he smilingly replied with the genotype of all value judgments: "They're bad!" Many social scientists have tried to follow the lead of the natural scientists in consigning value to the limbo of lost souls that never will be missed. And they have been aided and abetted by non-scientific scholars, both religious and secular, who have made *ex cathedra* pronouncements to the effect that science can tell 'how' to do things, but not 'what' to do. Even some who are willing to use science to discover the most efficient means to attain the ends about which there is general agreement will not accept its services to determine what ends should be sought. This position is taken, for example, by Fiegel (*7*) who states that: "It is one thing to *de*scribe by means of declarative statements what *is* the case, or to predict what will (probably) be the case if certain conditions are fulfilled; it is another thing to *pre*scribe by means of overtly or covertly imperative sentences . . . what *ought* to be done."

TRADITIONAL DUALISM BETWEEN FACT AND VALUE

It does not lie within the scope of this paper to formulate a reply to this point. Suffice it to say that the traditional dualism on the basis of which facts have been accepted as the proper realm of science, and values excluded, has in recent years been vigor-

[1] Presidential address, Division of Educational Psychology of the American Psychological Association, September, 1953.

ously assailed by philosophers and social scientists alike (*13*, *15*, *16*, *25*). The former, influenced to no small degree by Dewey (*5*) are represented among others by Geiger (*8*) who has stated his views as follows: "It is a little surprising then, that one of the most conspicuous (and mischievous) cultural hang-overs still plagues social science, just as it haunts natural science and philosophy. I refer to the antique dualism between fact and value . . . What are the alternatives? What are the substitutes for scientific inquiry in the handling of human values? . . . The answers can be found in brute power or in mystical illumination, in retreat to The Church (whichever one) or in esoteric obscurantism."

The psychiatrist, Franz Alexander (*1*) has written: "The discussion of this topic appears to me as much outmoded as a controversy over whether machines heavier than air can rise up against the force of gravity and fly . . . The dichotomy between 'facts and values' is a pseudo-distinction, and the problem of whether values belong to a realm which is beyond the reach of scientific methods is a pseudo-problem."

The anthropologist, Clyde Kluckhohn (*11*) believes that, "No tenet of intellectual folklore has been so damaging to our life and times as the cliché that 'science has nothing to do with values.' If the consideration of values is to be the exclusive property of religion and the humanities, a scientific understanding of human experience is impossible." And he quotes F. S. C. Northrup: "The norms for ethical conduct are to be discovered from the ascertainable knowledge of man's nature, just as the norms for building a bridge are to be derived from physics."

E. L. Thorndike (*26*), in his presidential address before the American Association for the Advancement of Science in 1936, stated that, "Judgments of value are simply one sort of judgments of fact, distinguished from the rest by two characteristics: They concern consequences. These are consequences to the wants of sentient beings. Values, positive or negative, reside in the satisfaction or annoyance felt by animals, persons, or deities."

VALUE PRESSURES ON THE SCHOOLS

In recent years philosophers have given increasing attention to axiology, the study (or science) of values. A few psychologists have addressed themselves to problems of choice or preferential behavior in organisms of higher complexity than the white rat, and some have pondered the nature of the social values of psy-

chologists. Anthropologists have observed and reported culturally-defined and strongly-held beliefs, codes and sanctions, and sociologists and economists have theorized about social and economic values, respectively. But educational psychologists have given scant attention directly to the problem of values and value judgments or seen that value theory, unformulated though it may be, permeates all educational interrelationships. It is my contention that this problem of values extends into the field of educational psychology, since it involves the study of the process by which individuals learn to make choices of means and ends, and of the interrelationships of these choices to each other in the life orientation of the individual.

Although educational psychologists and others directly concerned with educational problems for the most part have been silent on the subject of values, such taciturnity has not characterized the educational views expressed by certain other groups. Churchmen, for example, have of late begun to hurl the charge at the schools that they do not teach 'moral and spiritual values,' and about all the schoolmen could do was to shout back, 'We do so!' and then turn around and ask, 'What are values anyway?' The question was passed on up to the highest educational echelons, and at a conference of the Educational Policies Commission, certain members were unwilling to admit even that good health is a value, so great was the confusion on the subject. And the Commission as a whole could not agree on a statement regarding values freed from the sanctions of theocratic ideology. As a consquence it was decided to issue a monograph making a few suggestions (*6*) and encourage workshops in which teachers would develop their own concepts of moral and spiritual values, though it was pointed out that when spiritual values are defined in terms of theological doctrine, they are properly not a part of the school program.[2]

The ultra-intellectuals of the humanistic persuasion have likewise added their voices to those of the ecclesiastical critics, contending that the function of the schools is to transmit the cultural heritage and give training in the 'intellectual disciplines,' usually with particular emphasis on their own academic specialization. Replies to these gentlemen (*28*) have had to point out, among

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[2] Since the term 'spiritual' has so many different meanings (*27*), it might be better if its use were forbidden in educational writings and speeches, or if authors were required to furnish a definition of their meaning. (It might be going too far to demand an operational definition!)

other things, that there are likewise other values to be considered, inasmuch as their predilection for arbitrarily determined academic standards for all pupils revealed an extremely narrow view even of what knowledge is of most worth. Much more damaging potentially at least have been the attacks of the really hard-boiled ruffians who have employed the most questionable social-action tactics in several communities to win over supposedly democratically-reared citizens to their anachronistic obscurantism.

VALUE CONCEPTS IN EDUCATION

However, the axiological naiveté of many educators and of citizens generally when subjected to such pressures as these does not imply that problems of value are new to education. Scattered and uncoördinated efforts have here and there been successful in building value concepts into the structure of educational theory and practice. These efforts may be referred to briefly as intuitional, empirical, rational, and experimental.

The intuitional efforts are illustrated by the work of the great educational reformers, Rousseau, Pestalozzi, and Froebel, who did much to shift the value orientation of the schools from an authoritarian, society-centered pattern to one emphasizing individual needs and development. The importance of many values that have been traditionally neglected has been emphasized by the Progressive Education group of our own time, but still largely on an intuitional basis.

Values have of necessity been handled empirically by school boards and superintendents, since they are subject to the pressures of public opinion. As a consequence, health values (and some others as well) were forced in, but they had to enter through the back door of after-school, extra-curricular activities. Intellectual values have, of course, always been in good repute, but they have suffered from the enthusiasm both of the instrumental-value, formal disciplinarians, and of the latter-day saints of the aristocratic tradition, the absolute-value devotees of the humanities who believe, properly enough, that the schools should help to transmit the culture of the past, but who have different ideas as to what aspects of the culture should be transmitted. Political or power values have been encountered on the basis of which, at one extreme autocratic methods to develop subservience are advocated, while at the other democratic leadership is encouraged. Economic values have long been stressed from the early New England demand for the three

R's, trade training, and theological preparation, and later through the development of a wide range of trade and professional schools and the present-day emphasis on vocational education and guidance. Esthetic values have been generally neglected, while social values have been governed largely by the punitive theories derived from the tradition of Puritanism and of British legal positivism. The important task of helping young people to find any harmony of values in their life orientation has been left to fall between the mores-bound influence of their homes, the conflicting theologies of the churches, and the not very effective system of required and elective courses.

In contrast with this unsatisfactory empiricism, certain rationalistic hypotheses have been worked out and reflected in educational theory, even if they are not often clearly observable in practice. Evolutionary theory reinforced the intuitional view that nature is right and, therefore, should be followed, and the instinct hypothesis provided a temporary framework for understanding motivation, coupled with earlier motivational theory based hedonistically on pleasantness and unpleasantness which had introduced 'sugar-coating' methods into the schools. A behavioral theory of choice was embodied in Thorndike's satisfiers and annoyers, which seem still to be acceptable if translated to read, "objects and conditions having positive and negative valence." Psychoanalysis, though slow to catch on, is now deluging the journals with a motivation theory based on unconscious conflict (*19*, *10*).

Although Thorndike's reward-and-punishment experiments in the preferential behavior of chicks and kittens, which sired a library full of maze and puzzle-box experiments, are now more than fifty years old, and his 'Right'-'Wrong' experiments on young adults have attained their majority, they are rarely interpreted as having axiological significance. And the same is true of the Gestalt elaboration of perception and the Lewinian emphasis on a power field and psychological barriers. Paper-and-pencil tests of interests and attitudes come still closer to the heart of the axiological problem, while personality inventories, ratings, social-class investigations, opinion surveys, and case studies are right in the middle of it, though the researchers may not realize their location, and the results are largely unsystematic and unrelated.

As a consquence of the welter of intuition, empiricism, theory, and experimentation, educators have actually become well aware of one aspect or another of the problem of values in education,

but under another name. They have dealt with it as the problem of educational aims or objectives. They were forced by practical necessity to harmonize in some way the conflicting value claims of various pressure groups, theories, and research studies and the way chosen was to name committees, from time to time, to formulate a comprehensive list of educational objectives to serve as a kind of creed. The 1918 report of the Commission on the Reorganization of Secondary Education (*22*) listed seven 'cardinal' objectives: health, command of fundamental processes, worthy home membership, vocation, civic education, worthy use of leisure time, and ethical character. This value-packed list is still a good one, though lacking in anything that could be called a basic theory, as the term is technically used. That the list was not entirely satisfactory is evident from the fact that many other lists have appeared since, and various techniques have been tried out for formulating new objectives.

A direct attack on the problem of values has been made by relatively few investigators. Semantic difficulties have bedeviled the philosophers in their efforts to agree on the meaning of the traditional axiological concepts (*15*), and as a consequence a spate of new terms has gushed from the pens of the social scientists, particularly, Tolman, Parsons, Murray, and Kluckhohn (*23*). Although Woodruff (*32*) and others have used other lists of values, most of the research studies have employed the Allport-Vernon *Study of Values* (*2*) with understandably meager results since relatively little work has gone into this test since it first appeared in 1931 by way of item analysis, alternate forms, and adaptation to different age and culture groups.

VALUES IN EDUCATIONAL WORK AREAS

If educational psychologists are really to come to terms with the problem of values, they must do so in the three areas, of 'theory', 'research', and 'practice'. The question of values is a significant one in learning theory and in personality theory, as psychologists, social psychologists, sociologists, and cultural anthropologists are coming to realize, but scientists in these fields have not yet really begun to exploit the possibilities of the school as a social institution, or of the child in school as a learning, adjusting organism. If educational psychologists are to assume the responsibility which is theirs, they will include findings from these fields

within their province and also the cross-disciplinary concepts that are coming into favor, and no longer be satisfied with a pet list of wants or needs and vague intuitions as to the proper structure of a democratic school system. And if a satisfactory value theory for education is to be built, they will apply what is developing in semiotics, starting perhaps with Morris' (*20*) designative, appraisive, and prescriptive signs. They will distinguish more carefully between the desired and the desirable, and learn to identify and validate their criteria for the latter. More specifically, they will learn to distinguish between the 'I like' of personal taste or interest, the 'I want' of desire, the 'I need' of organic or social demand, the 'I ought' of interiorized sanctions, and the compulsive 'I must'. And they will likewise be able to put these different preferential verbalisms into the second and third person, and use them in the plural as well as the singular, on a rational, objective basis, as a result of impartial inquiry into facts and consequences, instead of deciding what others need and what ought to be done entirely from the narrow frame of reference of personal and group prejudice. They will of necessity analyze the dimensions of value suggested by Kluckhohn (*23*, p. 412 ff.), and translate them into the forms of behavior found in educational situations.

Well-formed scientific theory leads to its embodiment in research. As Hull (*9*) has said, if the actual, dynamic conditions unfold as a theory implies, the theory acquires an increment of verification, and the hypothesis so tested may tentatively be regarded as true; otherwise as false. So far, very little has been done to determine the effectiveness of the means for attaining the commonly held values, save those of intellect, and less still to discover whether there is a gain or even perhaps a harmful loss to other values resulting from the attainment of a valued goal or from the means employed to attain it. A growing research program will presumably result in the development of new and improved research instruments and techniques. Authors of interest inventories will be far more value-conscious, as in the case of the Maller and Glasser *Interest Values Inventory* (*18*) which contains an adaptation of the Allport-Vernon study. Interview techniques will be used more often to supplement the questionnaire, and other techniques will be developed and improved, such as the Bavelas (*3*) method of discovering a child's surrogate or 'sanction figure' for matters about which he is praised or blamed, and White's (*31*) value analysis method for describing qualitative data. When descriptive re-

search has begun to provide information about the value systems of individuals of differing ages in various economic, social, and cultural groups, we can look forward to studies of the effectiveness of specific educational techniques in developing behavior in the direction of objectives agreed upon as desirable, which will lead to sounder knowledge concerning the desirability of these objectives.

In educational practice instructional materials will no doubt be radically modified in order better to adapt to and promote individual and group values. Already the value shift from a curriculum-centered to an individual ability-centered ideal has resulted in studies of readability and the development of reading materials more accommodating to the imperfectly correlated verbal-ability and interest-maturity variables. The schools of the future will have the task of beginning instruction not only where the child is with respect to intellectual values, which has become an educational axiom, but also of beginning where he is with respect to other values as well. Perhaps most important is the necessary change in operational techniques, as illustrated by the emphasis on democratic in contrast with autocratic and *laissez-faire* group atmospheres. Madden (*17*) calls upon us to exorcise the authoritarian elements in both naturalism and supernaturalism and work for the integration and the differentiation of values through creative social action. The work of the teacher and of the educational psychologist in the school, whatever his title, will necessarily be harmonized, for teaching shares with individual and group guidance the task of helping young people to find a desirable value orientation, and to practice behavior in harmony with it.

There is as yet no generally accepted system of value categories owing largely to the fact that values differ in different groups and cultures and hence tend to be 'culture-bound'. However, there are advantages, for some purposes at least, in using a modification of the Allport-Vernon (*2*) list derived from the ideal types of Eduard Spranger (*24*). These categories are more or less familiar and are fairly easily understood, and their universality and high level of generality permit the values of an individual, an institution, and even perhaps a society to be ranked with respect to them, qualitatively (according to subsumed values) or quantitatively ranging from deficiency or deprivation through a middle optimum range, to satiety (at any one time), or to excess. It would be expected that persons and groups will differ within the optimum range, that

institutions, like the school, will provide varied opportunities for their members within this range, each person emphasizing in his life pattern the activities that are of value to him, and that the value orientation which he is helped to find will consist of a (to him) satisfactory balance or harmony among these values.[3] Judgments as to value emphasis will be made with as much foresight of consequences as possible. Such a framework used as a kind of check list calls attention to areas of overemphasis and of neglect, where corrective measures can be initiated.

VALUES AND THE SCHOOL PROGRAM

If such a valuistic approach to educational problems as has been suggested is to be built on modifications in theory, research, and practice, it will have to make direct contact with various aspects of the school program. For convenience these aspects may be regarded as 'curriculum', 'method', 'rating', 'guidance', and 'evaluation'.

The curriculum offers the opportunity for the widest use of value criteria (*4*, *30*), as may be illustrated with reference to the Spranger list. This list omits health values which it has been suggested (*29*, *12*, *21*) might properly be added. For the school these would include instruction in health and sanitation and an athletic and physical education program, one that does not conflict with other value activities. The cognitive or intellectual values have been and continue to be emphasized, but attention to other values also is not an indication of anti-intellectualism, the opinions of some of our intellectuals to the contrary notwithstanding. However, the aristocratic, ultra-intellectualistic tradition has had to give ground in order that other life values could be given positions of priority in the curriculum. Attention to esthetic values would call for the development of the now largely neglected art program, both appreciative and creative, with its satisfactions viewed not only as an end in themselves but also as a means to the maximization of other values in the curriculum (*14*). Attention to the political or power values would include appropriate emphasis on mental hygiene,

[3] It would seem that this is at least one of the ends that religion more or less successfully aims to promote, and therefore that Spranger's religious value with its immanent and transcendental mysticism, aside from its esthetic elements, is somewhat parochial and might advisedly be redefined in terms of desirable value orientation.

leadership, and pupil self-government, and to economic values on vocational education and training. The social or altruistic values, unlike the others might have no special period in the school day devoted to them, but like them would permeate and enrich the whole curricular program.

Good methods can glorify a meager curriculum and poor methods ruin a good one. Following a valuistic approach, curricular activities would be handled in such a way as to take advantage of all the values contained in them without, of course, needlessly distorting them for this purpose. Research studies in learning, achievement, and growth have thrown a great deal of light on the problems of the slow learner in the area of the intellectual values, but we are still rather primitive in our ways of dealing with learning problems in other areas—power, esthetic, and social, for example.

Ratings are made of teachers and of pupils on trait words which do not derive from any systematic personality theory, and which are seldom defined in behavioral terms. They are made with little or no recognition of the standards of conduct being employed, their source, their validity, or even their desirability, and with no knowledge of norms for different age groups, social class groups or any others. It is here, perhaps, that the evils of the implicit and unrecognized value judgment are to be most easily observed. The words 'bad' and 'good' are commonly used by parents, particularly in the area of the social values, with complete self-assurance. And teachers and administrators employ intervening scale points when required to do so. No need to ask, "Good for whom?" or "Good for what?" It is assumed that the school is responsible for the 'good' behavior, not the 'bad', for the 'bad' is evidence of the child's evil nature. Fortunately, many teachers are becoming a little less sure of the ratings they may still be required to make though they may not know why, and reports to parents are becoming here and there more sane (sometimes against the opposition of the parents!). There is increasing emphasis on 'understanding', causes for the lack of which lie in the discrepancies between individual and institutional value systems.

In the guidance movement, which has so recently burgeoned from the mystic marriage of the bench and the couch, values have become quite explicit, particularly in the economic and political or power categories. Guidance has perforce been more individualized than much in our mass educational system, and specific condi-

tions of person, time, and place have directed attention to individual needs for certain occupational and other rôles. Social demands and sanctions have been interiorized, and preferred behavior directively or non-directively indicated. At least to the extent that these things occur as a result of the guidance program, we can say that values have been intelligently handled, though perhaps largely on a utilitarian basis.

Evaluation is a word that is used frequently and easily by teachers and others without their realizing its relation to axiological problems. I have even heard teachers talk about evaluating a pupil, and without even batting an eye, and projects, even whole school programs, are often evaluated with the greatest of ease. There is no doubt an advantage in asking such questions as "Did you like it? Was it too easy or too difficult? Was the time profitably spent?" and so on. One must start somewhere. A professor once asked the director of a measurement bureau to help him make out an examination for one of his courses. The director asked him, "What are the objectives of the course?" This question so baffled the professor that he became quite angry, and indicated in no uncertain terms what he thought of people who would ask such a stupid question. In evaluation if anywhere values must be made explicit. They may be arrived at in various describable ways and judged on the basis of the means necessary for their attainment. The subgoals viewed as means to attain these values may be critically examined, and the methods employed in the attainment of the subgoals can be studied. Along the line it should be possible to do some measuring in order to determine the degree of effectiveness of the means and subgoals employed, or the extent to which the goal values were obtained and other values lost, or enhanced, in the process. This oversimplification perhaps suggests something of the complexity of the task of evaluation, of which many higher-level evaluators are quite aware. But they would be the first to admit, in the words of almost any doctoral thesis, that "further research is needed."

POSTULATES CONCERNING VALUE FOR EDUCATIONAL PSYCHOLOGY

If values are to have a more prominent place than they now hold in educational psychology, it should be possible to formulate a few tentative postulates which will serve to indicate something of what is involved, and also to summarize the point of view here presented:

1) Values, however named and categorized, are concepts, i.e., verbal constructs representing classes of objects or conditions cathected by individuals or groups.

2) While values as experienced are 'private' in the sense that they are a part of the inner life of the individual, they have significance only in the form of verbal or other behavior, in which form they may be studied directly and inferentially.

3) Value judgments are propositions about values that can be validated just as other propositions are validated, and hence properly come within the purview of the scientific method.

4) When value judgments are implicit, and they and the individual and social norms from which they are derived are not made explicit, semantic and other confusions in communication are likely to follow.

5) Value concepts may be of low or high generality, but whether values are viewed as means (individual or immediate goals) or as ends (more nearly universal or ultimate goals), evaluative judgments are based on known or anticipated consequences, or both.

6) Value systems (i.e., preference patterns) beyond such elementary physiological satisfiers as may exist, are not innate or fixed, but are acquired through a process of learning.

7) Learning within the institution of the school (and outside as well) involves modifications of values and value patterns, and such preferential behavior is therefore within the proper area of direct investigation of social scientists in general and educational psychologists in particular.

8) Since the values acquired by the individual act as determining tendencies which influence his behavior in ways that are of greatest importance to his own happiness and that of others, it follows that a significant part of the task of the educational psychologist is to contribute directly or indirectly to the value orientation of the members of the school community.

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GROUP INTEGRATION IN A CASE DISCUSSION COURSE[1]

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I. THE PROBLEM

The purpose was to study group integration. Group integration as used herein concerns the nature of the structure of the whole, as it may be represented by concepts of field psychology. This encompasses the relationships between the various parts—students, teacher, physical and psychological components of the classroom, and the college environment—that make up the whole which is the psychological classroom situation as seen from the viewpoint of the students.

A limited aspect of the interpersonal relationships was surveyed. This facet was determined by observing the functioning of the individuals within the group. Functioning was operationally defined as the way in which the individuals behaved toward one another. The rationale underlying the many measurements and specific hypotheses to be discussed may be conceptualized in terms of the following fourfold theorem, given in its hierarchical order:

a) The greater the degree of positive affectivity between members of the group,
b) the greater the degree of group integration,
c) the greater the adequacy of group function,
d) the greater the productivity of the group.

The present study was concerned with probing the relationship between 'a' and 'b'.

II. IMPORTANCE OF GROUP INTEGRATION

Few will deny the value of group integration in the classroom. From the viewpoint of the individual personality certain individual

[1] This study was carried out under a Fellowship in the Department of Human Relations at the University of Kansas. The writer is indebted to the staff of the Department of Human Relations and to the staff of the Department of Psychology for constant stimulation; to Dr. Hilden Gibson, Chairman of the Department of Human Relations for his aid; to Dr. Edward G. Nelson for permitting the use of his class for the experiment; to Dr. Anthony J. Smith for statistical advice; and to his wife for constant assistance.

needs can find their satisfaction in only group membership. From the viewpoint of the group, unless it satisfies individual needs, it will not long survive. From the viewpoint of the teacher, integration may further the learning process. From the viewpoint of social psychology, group integration denotes an equilibrium at an advanced developmental level, with unitary function as its salient characteristic. Group integration thus satisfies personal, educational, and social needs. A classroom group in rapport and bound together in the pursuit of a common goal is potentially more productive than is a less well-integrated group. The integrated group is superior because their social structure functions to make the resources of each member of the group available. The complexity of contemporary interpersonal relationships in the social field, as well as pressing national and international problems, make it mandatory for educators to provide students with concrete experiences in group problem-solving situations.

III. THE SUBJECTS AND THE SETTING

The subjects were twenty-five male college students in a case-discussion course at the University of Kansas. Twenty were juniors, five were seniors. They were studied in the spring semester of a one-year case-discussion course, therefore, some students were acquainted from the previous semester and all had experienced one semester in this type of case-discussion course.

In this classroom, students and teacher are seated around a large table, vis-a-vis. The teacher plays a permissive rôle, calculated to enhance spontaneity of expression by the students. Barker and Wright (*1*) have suggested the importance of the setting in which interpersonal relationships take place. Behavior settings are coercive in that they tend to elicit activity appropriate to them. The writer found this a valuable guiding principle.

IV. METHODOLOGY AND RATIONALE

It was considered fruitful to study group integration from the viewpoint of the members of the class, to assess the affective aspect of the psychological environment by determining their feelings toward one another. Experience suggested that one useful index of affectivity would be the choice of associates, and that the pattern of choices could be related to group structure. The choice pattern was determined by sociometric techniques as outlined by Moreno

(*10*). These were used to portray interpersonal classroom relationships. Pioneer work in this area has been done by Berrien (*4*), whose book, *Comments and Cases on Human Relations,* contains tentative research findings. An enduring interest in this area was engendered by a stimulating year with Dr. Berrien at Colgate University as colleague in teaching the Human Relations Course.

When rapport had been established, the following questions from which the sociometric data have been collected were read to the class:

1) With what five members of this class do you now spend most of your leisure time?
2) With what five members of this class, would you—if you could—spend most of your leisure time?
3) Let us assume a problem comes up in class on which you can work in small groups. Choose the five with whom you would most like to work.

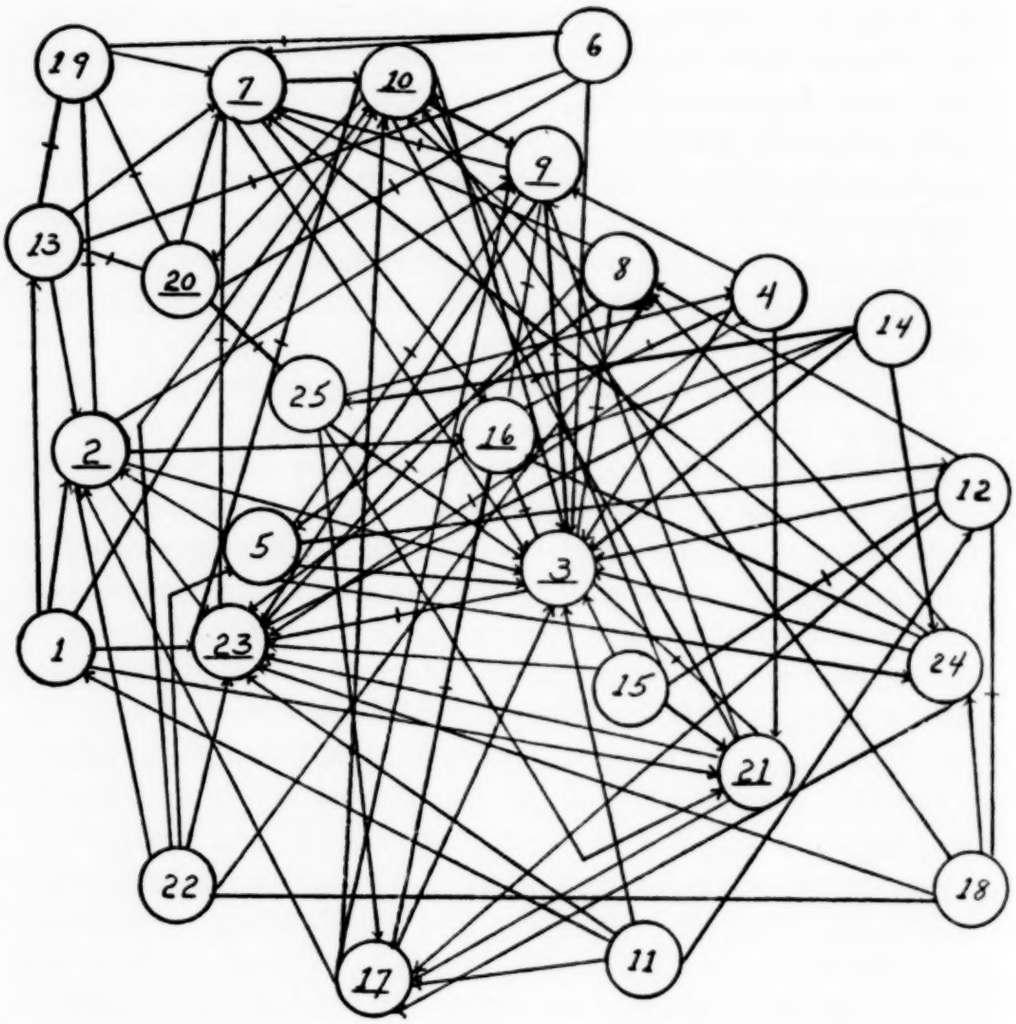
As mentioned previously, group integration, tested sociometrically, was approached primarily from the viewpoint of the students. However, it is apparent to any educator that the group does not function independently of the teacher and first-hand observation suggests that though the teacher may be physically absent, he is nevertheless psychologically present. The writer has previously affirmed his conviction concerning the importance of the atmosphere created by the teacher and the setting. Therefore, the writer felt it would be productive to explore the teacher's knowledge of the group's structure.

The Bard of Avon has sagely observed, "It is a wise father that knows his own child." One might say, "It is a wise teacher that knows his own class," because of the gulf in years, knowledge, and ideals which sometimes separates teachers from students. This aspect was probed by asking the teacher for three rankings as follows:

1) Predict the order in which the students will be chosen as work associates.
2) Predict the order in which the students will be chosen as leisure-time associates.
3) Rank the students according to grade standing.

V. DATA AND INTERPRETATION

A) *Sociometric analysis.*—A work sociogram was drawn up from the data of question 3). It reveals a complex well-integrated social



WORK SOCIOGRAM

structure. Many people are chosen by others, several individuals receive many choices. Further evidence of group integration is the appearance of well-integrated subgroups, denoted by mutual choices between three and four individuals, yet none of these subgroups are removed from the group as a whole. Moreover, the whole is connected by many chains of relationships whose peripherations are far-reaching. The sociogram points to a hierarchical differentiation as follows:

1) Leaders—those who receive many choices.
2) Followers—those who receive an intermediate number of choices.
3) Isolates—those who receive no choices.

Our understanding of social structure may be augmented by applying the concepts of other social scientists. Barnard (*2*) has emphasized the distinction between scalar and lateral lines of organizational structure. The term scalar refers to vertical lines which go up-to and down-from the organizational hierarchy. The term lateral refers to lines which go between members on the same level, such as worker-worker, etc. There is general agreement that effective organizational structures are articulated by an interlocking network of both lateral and scalar lines. The sociogram manifests these characteristics. Many lines go to those who may be characterized as being on the 'top level', in terms of the number of choices; for example, numbers 3 (eighteen lines or choices), and 23 (fifteen lines or choices). There are also many interconnections on the lower levels.

Another contribution to the understanding of group structure has been made by Bavelas who has extended Lewin's topology by techniques that permit a mathematical analysis of group integration in terms of hodological space. Bavelas (*3*) has suggested that rapidity, direction, and extent of spread of communication depend partly upon the pattern of connections between individuals in a group. In this frame of reference, we may consider each individual as a center of communication and the lines between individuals as links of communication. Applying this hypothesis to the sociogram, it seems reasonable to assume that, within such a well-integrated group, communication should spread rapidly and become widely disseminated.

While the preceding techniques permit us to represent the structure of the group, other techniques must be utilized to fathom the causal properties of these interpersonal relations. Observations of the individuals functioning in this group and in other groups, as well as socio-economic data, may provide valuable clues. Because the primary purpose of this research was an attempt to delineate group structure rather than to explain it, only a brief example will be given. One member who received many choices had a high scholastic standing. His participation was high in frequency and quality, and he evinced a general skill in communication. The reason for

his high number of choices was apparent. However, another who received many choices was virtually a non-participant in class-discussion. The reader would be correct in postulating some prestige factor unrelated to the classroom situation. Though a mediocre student, he was a well-known athlete. These examples of qualitative and quantitative analysis illustrate rich possibilities in exploring the factors which determine group structure.

B) Statistical validation of sociometric data.—(1) Introduction: The sociogram was constructed from one variable—the students' choice of work associates. Two students were termed isolates—they received no choices. However, to gain a more adequate understanding of an individual's acceptability—in terms of choices received—it is necessary to sample different kinds of criteria. It may happen that the student who is chosen for intellectual ability may not be chosen for athletic prowess. However, such a situation need not unnecessarily concern a teacher, for this individual may not feel psychological isolation as his abilities have been recognized by his peers in the intellectual area. Therefore, in the following statistical validation of the sociometric data, the writer chose to deal with combined variables, since the group endures, to some extent, beyond the confines of the classroom.

All three variables—present leisure-time associate, preferred leisure-time associate, and preferred work associate—were combined into a total choice pattern for each individual, yielding the pattern for the group as a whole. The sociometric indices that follow have have been developed by Bronfenbrenner (*5*). The reader will find a full development of the rationale and statistical computations in the reference given.

(2) The Sociometric Indices: In the Social Choice Index, Table 1, the writer has departed from Bronfenbrenner's terminology which considered the total number of choices received by a subject the 'Social Status Index' in favor of the more accurate, 'Social Choice Index' suggested by Loomis (*6*). The values computed were:

1) The Mean ..... $\bar{X} = 15.$
2) The Standard Deviation ..... $\sigma = 5.97$
3) The Appropriate Degree of Skewness ..... $A_3 = .097$

The mean and the standard deviation permit the transformation of each score into a standard score equivalent, which can be checked in Salvosa's Tables (*11*) under the appropriate degree of skewness thus yielding the probability of chance occurrence.

TABLE 1.—SOCIAL CHOICE INDEX

I Student Number	II Number of Choices Received	III Upper Limit	IV Raw Score Deviation	V Standard Score Equivalent	VI P. of Chance Occurrence
	S	L	L-M	$\frac{L-M}{\sigma}$	P.
22	2	2.5	−12.5	−2.093	*.0157
1, 11	3	3.5	−11.5	−1.926	*.0245
15, 18	5	5.5	− 9.5	−1.591	.0527
14, 4	7	7.5	− 7.5	−1.256	.1037
5	10	10.5	− 4.5	− .753	.2270
2, 24	11	11.5	− 3.5	− .586	.3040
12	12	12.5	− 2.5	− .418	.3430
13	14	14.5	− .5	− .083	.4730
17, 8	15	15.5	.5	.083	.5390
21, 25	16	16.5	1.5	.251	.6047
16	18	18.5	3.5	.586	.7240
20, 10	19	19.5	4.5	.753	.7765
6, 9, 19	23	23.5	7.5	1.256	.8935
7	27	27.5	12.5	2.093	*.9793
23	32	32.5	17.5	2.931	†*.9975
3	38	38.5	23.5	3.936	†*.9998

* P. < .05
† P. < .01

The Social Choice Index provides a clue to group integration. The scores of three students are so low that they could occur by chance only three times in a hundred. On the other end of the continuum, one student received so many choices that this could have happened by chance only three times in a hundred. He is surpassed by two others whose choice totals are so large that this could have happened by chance only once in a thousand times. Our statistical treatment permits us to state that such results were not due to adventitious circumstances but may be attributed to the social determinants in the classroom situation.

The number of isolates has been considered an indication of group integration. In the combined data, no isolates appeared. The probability of zero isolates as computed by the Index of Isolation was .0096 (P. < .01). This is a statistically significant indication of group integration.

The number of reciprocal choices is important to group integration, for this reveals the number of individuals who are in accord with one another. The total used is the total mutual choices for each category computed separately which amounted to eighty-nine. A computation of the Index of Coherence yielded a value of .00001 (P. < .01), which affords further indication of group integration. Thus all three indices have been found statistically significant and the writer interprets this as complementing the conclusions concerning group integration which were based on the work sociogram.

C) The application of correlation statistics.—(1) *The Phi* Coefficient of Correlation: It is important to determine whether the same individuals were chosen for two categories. The question explored may be phrased as follows: Does student #1 tend to choose student #2 as both preferred leisure-time associate and present leisure-time associate? The phi coefficient yielded a value of .583 (P. < .01). We may therefore assume that those preferred as leisure-time associates are the present leisure-time associates, that the students tend to actualize their preferences in this area. In computing the rank correlation coefficients which follow, the writer discarded the category, present leisure-time associate, in favor of preferred leisure-time associate, so that both work and leisure-time choices would be an expression of preference. Table 2 presents a list of all the correlations.

(2) *The Spearman rank difference correlations:* The writer has accepted the sociometric data as supporting the hypothesis of group integration. This hypothesis was next tested in a different way. The writer believed that under conditions of group integration, an individual's score in one category would be positively related to the score that this individual would receive in the other. This would be consistent with Homans' (7) hypothesis that the feelings generated within one system of relationships (the classroom) would tend to perpetuate themselves by flowing into another system (the extra-curricular and social). Then, too, it must be remembered that the specific task for which associates were chosen was that of working on a classroom problem in a small group. This would in-

TABLE 2.—CORRELATION COEFFICIENTS*

	C.C.	Sig. Level
A. *Spearman Rank Difference Correlations:*		
1) Teacher's prediction of work associate and student's choice of same	.617	P. .01
2) Teacher's prediction of leisure-time associate and student's choice of same	.529	P. .01
3) Teacher's prediction of work-associate and student's grade standing	.424	P. .05
4) Teacher's prediction of leisure-time associate and student's grade standing	.193	Not sig.
5) Teacher's prediction of leisure-time associate and teacher's prediction of work associate	.583	P. .01
6) Student's choice of work associate and student's choice of leisure-time associate	.750	P. .01
7) Student's choice of work associate and student's grade standing	.490	P. .05
8) Student's choice of leisure-time associate and student's grade standing	.270	Not sig.
B. *Phi Coefficient of Correlation:*		
1) Student's choice of leisure-time associate and student's present leisure-time associate	.583	P. .01

* The writer has recognized a statistical problem in that it is, to some extent, a matter of judgment upon the part of an experimenter whether the teacher may be considered as a criterion. This is not an academic problem for on this decision rests the appropriateness of the correlation formula to be used. In order to resolve this problem and in the interests of experimental rigor, the writer has calculated these eight coefficients by formula A and B. (*8*) The differences ranged from .015 to .05, but in no case would the use of the other formula have changed the statistical significance of the results. The formulas used are those suggested as appropriate by Kendall for data of this nature.

volve intimate interpersonal relations common to both systems of activity. The coefficient between the students' choice of leisure-time associate and the students' choice of work associate was .750 ($P. < .01$). The writer interprets this result as further support for his hypothesis of group integration.

The writer did not hypothesize concerning the relationship between the students' choice of work associate and the students' grade standing. On the one hand grades are based on the ability to

analyze a case in a written report, as well as the ability to communicate and participate in the class discussion. One could therefore predict a positive relationship because of the similarity between the grade criteria and the task. A positive relationship might also be argued on the hypothesis that, since students know one another's grade standing, they would tend to work with the best students in order to gain good grades. On the other hand, it might be argued that while work and leisure-time associates are highly correlated ($P. < .01$), this may be due to a global interpersonal attraction, but that this is not necessarily contingent upon a student's grade standing. Then, too, social pressures might influence the individual to choose as a work companion, a failing student who was a fraternity brother or friend. The Spearman Rank Difference Correlation Coefficient was .490 ($P. < .05$). Thus there is a factor common to both, but the data do not allow us to state its nature. The writer interprets this finding as favorable to integration in that, since it is positive, we do not have a social climate in which a student's grade standing works against him and has the effect of his not being chosen as a work associate.

Concerning the relationship between a student's grade standing and his desirability as a leisure-time associate, the writer hypothesized that these would not be related, since grade standing is seldom a determinant of social acceptability. The Spearman Rank Difference Correlation Coefficient was .270 which is not significant —one of the lowest correlations reported in this paper.

In the present experiment, the primary concern with the sociometric data was experimental rather than pedagogical. Nevertheless, the practical value was not overlooked. After the teacher had ranked the students the writer divulged the sociometric data, which were then used by the teacher in furthering the goals of the course.

The correlation between the student's choice of work associate and the teacher's prediction of the student's choice of work associate was .617 ($P. < .01$). The correlation between the student's choice of leisure-time associate and the teacher's prediction of the student's choice in this area yielded a coefficient of .529 ($P. < .01$). Thus in both areas, the teacher was able to predict the students' choices to a degree inexplicable by chance. The writer believes the methodology is one factor which enables the teacher to know the structure of the group.

With respect to the relationship between the teacher's prediction of the students' work associates and the students' grade standing, the coefficient was .424 ($P. < .05$). We may, therefore, state that the teacher tended to predict that students who had the highest grades would receive the highest number of choices as work associates. The relationship between the teacher's prediction of the student's choice of leisure-time associate and the student's grade standing was also computed. The coefficient was .193, statistically insignificant, the lowest correlation reported in this study. Since it was found that there was also little relationship between the students' choice of leisure-time associates and the students' grade standing, we may conclude that, from both the viewpoint of the teacher and the students, grades have little relationship to choice of leisure-time associates.

The relationship between the teacher's prediction of work associate and his prediction of leisure-time associate was positive and significant, the coefficient was .583 ($P. < .01$), and mirrored the relationship between the students' choices in these areas.

In conclusion, the teacher's predictions accurately reflect the choices made by the students. The writer interprets this as important to group integration in that the teacher evinces a sound understanding of his class' social structure. When the teacher is able to perceive the social situation as experienced by the students, an attitude which Mead has described as assuming the rôle of the generalized other (*9*), this common perception should lead to greater clarity of communication between the teacher and the students which, in a permissive atmosphere, may be expected to facilitate group integration.

VI. SUMMARY AND CONCLUSIONS

The results suggest that the hypothesis of group integration is tenable. Sociometric analysis provided qualitative indications, and the sociometric indices were found to be statistically significant. Correlation coefficients affirm that the relationships between student-student variables and teacher-student variables cannot be attributed to chance. However, the writer cautions against generalizing these findings to other case-discussion courses. Any group that is together over a period of time develops some kind of organization. Further research is needed concerning the degree of inte-

gration within other courses, as well as exploration of other variables of group organization.

From the viewpoint of the writer, the causal nexus is that these students shared common goals while interacting as a group, in a permissive environment. Individual needs could be satisfied only through group problem-solving; conversely, the group could function adequately only if individual needs were satisfied. This manifests the interdependence of group and individual activities. Individual and group satisfaction are complementary. When individuals find personal satisfaction and group acceptance in their interpersonal relationships, group integration emerges.

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SOME RELATIONSHIPS BETWEEN STUDENTS' PERCEPTIONS OF SCHOOL AND THEIR ACHIEVEMENT

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Many studies have been made which relate the intelligence, interests, aptitudes and personality characteristics of students to their achievement in school. Relatively few experiments have been reported which indicate how the school appears to the students and how this factor might be related to their scholastic success. The purpose of this study was to investigate some relationships between students' perceptions of various aspects of the school situation and selected criteria of school achievement. The general hypothesis of the study was: *There is a relationship between measures of students' perceptions of school and achievement in school.*

METHOD

Sample of Students.—Ninety-two students, representing almost the entire eighth-grade population of the Solvay, N. Y., public school system, were selected as the student sample.[1] This school system was selected because students enrolled came from family backgrounds which were proportionately representative of socio-economic stratification in upper-New York State. All students had been subjected to the same teachers and general school influences for at least two years; the majority had been enrolled in the same grammar and junior high schools for at least five years. In this way, some control over the effects of school factors on students' achievement was obtained.

Measures of Perception.—All subjects were tested with three instruments designed to measure perceptions of school; a sentence completion test consisting of fifty incomplete sentences; a ten-card apperception test, the pictures of which depicted children in various

[1] Mr. John McAnaney, Guidance Director of the Solvay Schools, and Miss Anna Murtaugh, Principal of Intermediate School, were extremely coöperative, and the writer is indebted to them and the teachers involved.

school settings; and an autobiographical-type composition in which students expressed their feelings about various aspects of school.

Each of these instruments was subdivided into five areas in an attempt to obtain indices of students' perceptions of their teachers, classmates, achievement in school, school discipline and school in general. Thus, total test scores and five subarea scores for each of the three perceptual tests were available for correlation with the achievement criteria.

A five-point rating scale was devised in order that responses to the various perceptual test stimuli could be judged by independent raters:

> Rating 1 indicated that the response portrayed a definitely positive perception of the variable in question (pleasure about, liking for, acceptance of in a positive manner, or hopeful about).
>
> Rating 2 indicated that the response portrayed probable positive feelings about the aspect of school in question.
>
> Rating 3 indicated that the response portrayed neutral or otherwise unscorable responses (purely descriptive, no feelings expressed, or insufficient material to rate in any other way).
>
> Rating 4 indicated that the response portrayed probable negative feelings about school (displeasure about, dislike of, anger or hostility towards).
>
> Rating 5 indicated that the response portrayed definitely negative feelings about the aspect of school in question.

In addition, each response was rated with respect to the subarea of school towards which the response was directed. This was necessary because, for example, although on the Personal Document Test a student might be asked to write about a particular aspect of school, e.g. "My Teachers," his response might also include some statements about how he felt about his school work, discipline, and so forth.

A prestudy group of fourteen eighth-grade students (seven boys and seven girls, with intelligence quotients within the normal range) was used to determine whether the tests would elicit unique, spontaneous expressions from the students without their becoming aware of the "kind of inference the experimenter intended to make" (*10*, p. 215). Results from this group, evaluated by three judges independently, confirmed the validity of this assumption.

DESCRIPTION OF THE PERCEPTUAL TESTS

A) *The Sentence Completion Test* (SCT).—In its original form, seventy-five items were selected for this test but twenty-one were

eliminated by a board of three psychologists on the basis of being too ambiguous, too highly structured so they elicited only one type of response, or too difficult in grammatical construction to yield other than 'neutral' replies. Four additional questions were discarded to round off the number of items at fifty, leaving ten incomplete sentences for each of the five school areas tested. The following pattern was set up for administration purposes:

Sentence Number	*School Area*
1, 6, 11 . . . . . 41, 46	School in general
2, 7, 12 . . . . . 42, 47	Teachers
3, 8, 13 . . . . . 43, 48	Classmates
4, 9, 14 . . . . . 44, 49	Discipline
5, 10, 15 . . . . . 45, 50	Achievement

The test was administered in group form and results were analyzed by use of the five-point rating scale described above. A description of this test has already been reported (*6*).

B) *School Pictures Test* (SPT).—This test was devised and has been used by a group of advanced graduate students at Syracuse University, under the direction of Arthur W. Combs. In its original form, the test contained twenty pictures. However, analysis of the stories given by the prestudy group showed that there tended to be much repetition on several of the cards and that, in fact, practically as valid an interpretation of feelings could be made from ten cards as from all twenty. Therefore, ten cards, two representative of each of the five school areas under consideration, were selected for the final experiment.

In its construction, purpose, use and administration, the School Pictures Test is similar to other apperception tests, with the exception that all pictures are structured in the school area only. However, scoring procedures for this experiment were slightly different from those commonly used; the five-point rating scale already described was used to quantify the responses received from SPT. A complete description of this test is available elsewhere (*6*).

C) *Personal Document Test* (PDT).—In addition to obtaining data from the sentence completion and apperception tests, it was felt advisable to administer a test which would provide spontaneous, verbatim statements from the students themselves about the various aspects of school in question. This test was divided into five areas, entitled, "My School," "My Teachers," "My Class-

mates," "My Work in School," and "Behavior in School." The test was presented to the subjects in a group (studyhall) situation, using standardized directions for writing the composition. Two full periods for completion were permitted by school authorities where necessary. Most students spent from thirty-five to fifty minutes on the task.

The PDT was analyzed and scored on the basis of the same five-point rating scale used with the other tests. Like them, also, judgments were made as to the aspect of school represented in each response since, in spite of topical headings outlined for each section, more than one feeling-tone was expressed in all the compositions. Consequently, each student tended to yield a different number of rated statements about each school area. In order to obtain a subarea score, then, all responses relating to that area were summed and the mean score obtained was used as the subarea score.

Reliability of ratings.—Four judges, including the examiner, independently analyzed and scored fifty SCT protocols, thirty SPT and thirty PDT protocols. Inter-judge correlations ranged from .78 to .92 for the three instruments. In addition, re-test reliability estimates, based on re-rating of these protocols six months later by the examiner, were .88 (SCT), .80 (SPT) and .89 (PDT).

It was felt these reliability estimates were high enough to justify the assumption that experts tended to rate responses to the three perceptual tests essentially the same and that the examiner showed consistency in his ratings.

When the same four judges independently indicated the school areas to which individual responses belonged, percentage agreements ranged from seventy-four to one hundred with the examiners' ratings. Again, it was felt the agreement was high enough to assume that experts tended to agree with the examiner in their judgments of the aspect of school indicated by students' responses.

A correlation between the SCT and SPT of .71, suggests that a large common element was being measured by these two instruments. The correlation between the SCT and PDT was not so high (.58) and the correlation between the SPT and PDT was .52. The lower correlations between the PDT and the other tests may be a function of the PDT being a less-disguised projective method than either the SCT or SPT. It should be pointed out that there were no empirical validity estimates available for any of the three

perceptual tests; justification for their use was based on pre-experimental group experience with them and the logical validity which is commonly accepted for projective instruments.

Achievement criteria.—Two measures of achievement, end-of-semester grades and standardized test scores, were used. It was not presumed that these two methods measured achievement in the same way. School grades are subjective (teacher) ratings of students' class work, while standardized achievement tests provide a more objective measure of how much a student knows about a particular subject matter, regardless of such factors as intelligence, personality traits, age, or ability to get along with others.

End-of-semester grades in four basic curriculum subjects—English, mathematics, social studies, and general science—were assigned number-values from one to five, corresponding to letter grades A through E (failure). The mean score for the four subjects was obtained, and this score was used to represent the grade-score for each student. Because of time limitation, only the Stanford Reading Test and Stanford Arithmetic Test were administered from the entire Stanford Achievement Test Battery. These yielded relatively objective measures of achievement.

Intelligence criterion.—In order to partial out the effects of intelligence on achievement, the California Test of Mental Maturity S-Form was used. The Total Test IQ was used as the index of intelligence. The mean IQ of the sampling group was 105.30, with a standard deviation of 12.51.

Statistical procedures.—Product-moment correlations were computed between total and subarea perceptual test scores and the three achievement criteria, using Shephard's correction because of coarseness of groupings in the perceptual test ratings. Partial correlation coefficients were then computed, thus mediating the effects of mental ability on achievement. The latter data were of primary concern to the findings of the study.

RESULTS

Table I represents the relationships between the measures of perception and achievement with the effects of intelligence partialed out. The findings may be summarized as follows:

1) The correlations between mean total scores of all three perceptual tests and mean end-of-semester grade scores were signifi-

TABLE I.—PARTIAL CORRELATION COEFFICIENTS

Test	Stanford Arithmetic	Stanford Reading	Mean Grades
Sentence Completion Test	.27	.06	.57
School Pictures Test	.13	.06	.45
Personal Document Test	.02	−.03	.31
Subareas of Perceptual Tests			
School in General			
Sentence Completion Test	.14	−.03	.39
School Pictures Test	.02	.07	.25
Personal Document Test	.23	.05	.14
Teachers			
Sentence Completion Test	.08	−.01	.57
School Pictures Test	.15	−.02	.39
Personal Document Test	.02	−.02	.08
Classmates			
Sentence Completion Test	.01	−.01	.29
School Pictures Test	.22	.07	.31
Personal Document	−.03	.04	.12
Achievement			
Sentence Completion Test	.30	.03	.48
School Pictures Test	−.04	.04	.31
Personal Document	.15	.02	.48
Discipline			
Sentence Completion Test	.26	−.02	.38
School Pictures Test	.22	.07	.32
Personal Document	.02	−.05	.16

cant at the one per cent level of confidence, although the correlation between the PDT and grades was quite low (.31).

2) All correlations between subarea scores on the SCT and SPT and end-of-semester grades were significant at the one per cent level of confidence but only one subarea score on the PDT (interestingly enough, the subarea representing students' comments about their own school work) was significant at this level.

3) Although approximately one-third of the correlations between total and subarea perceptual test scores and Stanford Arithmetic Test scores were significant at the five per cent level or better, they were all so low as to suggest little relationship between the variables.

4) There were no significant correlations observed between

measures of perception and the Stanford Reading Test. All correlations, both between total and subarea perceptual test scores and the reading test scores, clustered around zero, with almost as many negative as positive correlations. Obviously, no relationship occurs between these measures of perception and achievement.

Thus, the conditions of the hypothesis, *There is a relationship between measures of students' perceptions of school and their achievement in school,* were fulfilled with respect to one type of achievement criterion, end-of-semester grades, but were rejected with respect to the second type of achievement criterion, standardized achievement tests.

CONCLUSIONS AND DISCUSSION

On the basis of obtained results, the following conclusions seem appropriate: 1) Students' perceptions of school, and various aspects of school, seem to be related to achievement in school as measured by end-of-semester grades. It is not possible, on the basis of present evidence, to determine a cause-effect relationship between the two variables but speculation leads to one of two possibilities. First, suppose that the child's low grades are caused by negative feelings about school. Logically, one might expect the following cycle to take place: The child dislikes school, obtains low grades, dislikes school even more, and continues to get low grades. On the other hand, suppose that negative feelings about school are caused by low grades; the converse of the above process takes place, but with the same results accruing—low grades and dislike of school, or high grades and positive feelings about school.

It is significant that both the SCT and SPT subareas suggest significant relationships between grades and how students view such specifics as teachers, discipline, school work and peers, as well as the generalized concept of 'school'. Several studies in the past have shown relationships between attitudes towards teachers and grades (*4*, *5*) but none other has shown relationships between all these areas in one experiment.

2) Students' perceptions of school, and of various aspects of school, do not seem to be related to achievement as measured by standardized achievement tests. The weight of evidence suggests that there is little relationship between how children view their school situation, and certain aspects of it, and their objectively-measured knowledge of arithmetic and reading. These findings are

in general agreement with Sawin's findings in the arithmetic area (*8*) but disagree with those pointed out by Sheldon (*9*) in the reading area. This suggests that further work in this area is needed.

SUMMARY

Modern theory of perception holds that how a person views himself and his world governs his behavior. This study, which has been exploratory in nature, set out to ascertain some relationships between students' perceptions of school and their achievement in school, when mental ability was held constant. Results obtained were equivocal. Little or no relationship existed between measures of perception and standardized achievement test scores, which are objective measurements of the cumulative effects of knowledge in particular subject matter; significant relationships were found between measures of perception and end-of-semester grades, which are subjective evaluations of scholastic achievement predicated on the immediate effects of knowledge. In view of the latter correlations, further consideration of the ways in which students view their school situation provides a suitable and profitable area of educational research.

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COMMUNICATION THEORY AS THE UNIFYING THEME IN TEACHING EDUCATIONAL PSYCHOLOGY

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Those who have taught the beginning course in educational psychology have recognized the difficulty in unifying the diverse material on motivation, measurement, child development and learning and, at the same time, presenting it in such a way that it will aid the prospective teacher in understanding the child and in guiding him in his life adjustments. Efforts to organize the course vary from a formal systematic approach to plans centering in one or another aspect of the material which the author or teacher considers to be of fundamental importance. It has, perhaps, been difficult to order the materials in a developmental sequence from basic definitions to final generalizations since educational psychology is not a discipline in the formal sense but an applied field drawing on many disciplines.

One attempt to achieve integration has been made by those who would organize the course around child study. This method unifies the material by bringing it to bear in understanding the growth and development of the child as a whole. This may be said to represent the individual psychological approach. Another conceptual frame for organizing educational psychology might be called the social-psychological. Those who organize the course around personality in society and culture would fall into this category.

Still another example of the social-psychological approach will be discussed in this paper. This is a description of an attempt to use communication theory as a central theme in the development of the course. It is suggested that this approach may accomplish two objectives: it serves to integrate the seemingly scattered materials which are drawn from several social sciences, and it brings the individual behaving as a whole into clear focus within a complete social-cultural context. This comes about by viewing the manner in which society, culture and personality influence the

meanings which an individual acquires and which form a basis for personal and social action.[1]

The course opens with a view of the classroom as a system of interacting individuals. Each person interacts with the others by communicating symbols. These symbols are made up of signs, which are the objective facts of the environment such as sounds, sights or movements, plus the meanings which the respective individuals give to these signs. Pupil and teacher behavior are, in good measure, functions of the symbols which they perceive in their environment.

A principal objective is to help the prospective teacher to an awareness that the meanings which the learner is constantly perceiving may be quite different from those that the teacher may intend to communicate. We explore the way the same objective facts of the environment, whether they be auditory, visual, kinesthetic or other stimuli which we have referred to as signs, may be given different meanings by different pupils depending on their personalities and the social and cultural background from which they view them. The course revolves about the manner in which symbols emerge or evolve for an individual as he attributes his meanings to the signs in the environment.

To illustrate: we discuss how a simple critique by a teacher of a pupil's statement may be understood by one pupil as insinuating his stupidity or by another as a vindication of his intelligence. Some pupils may even find in it a suggestion of racial discrimination or yet another pupil may see it as suggesting a better way to attack the problem at hand.

Since a pupil's behavior is partially determined by the symbols which he personally develops, or by the meanings which he reads into the signs in his environment, it becomes important for us to study some of the influences which determine the way in which a sign gets its meaning and so becomes a symbol. Thus, we try to understand such things as his social and cultural background and his attitudes towards his environment and himself. All of these enter into the context from which the meanings develop. This also

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[1] This description is based on a one semester course which was given at The City College of New York. It has lent itself to adaptation to new cultural conditions and is now being taught as a year course at The Hebrew University in Jerusalem, Israel. An outline of the course of study is available upon request from the author.

implies discussion of perceptual processes and the way in which they structure the meanings which an individual acquires.

For example, we draw upon sociology to understand the social context in which meanings emerge. Conditions of social stratification are considered as they may influence, for instance, the different ways in which working-class and middle-class pupils may interpret the communication of a middle-class teacher. Thus, we are interested in what happens when a teacher condemns a boy for physically striking back at an assailant after his father has told him that any other behavior in that situation would be unmanly.

Sociology is further applied in studying social rôles. We investigate the manner in which individuals use symbols to tell others what behavior they expect in certain situations. As an instance of this, we would be interested in the meaning which a pupil might see in the teacher's leaving the room if he were involved in an authoritarian teacher-pupil rôle. How would the meaning differ for a pupil interacting in a democratic situation? What problem would arise for the pupil who had been accustomed to the authoritarian and then finds himself in a class where democratic rôles are the rule? Can the teacher do anything to help change the meanings which this pupil might impute to the situation?

Anthropological findings help us to understand the influence of the cultural ethos in producing meanings. For instance, the problem that the teacher faces in communicating with pupils from varying cultural backgrounds is discussed. How do they implicitly judge the teacher's behavior when it does not correspond to the folkways and the mores which they have learned to accept as proper? Thus, the class might study the problems that the northern-bred teacher would face in teaching in a southern school.

Studies in personality enter as we talk of the development of the self and the way in which individuals refer their meanings to it. Does learning to read appear as a threat to be avoided simply because an individual has learned to think of himself as inadequate?

Research in developmental psychology does not come under consideration as a dry report of facts and figures. Rather, we ask about the effect of particular developmental stages or the effect of being a short boy among tall girls upon the meanings which an individual reads into his environment.

Then, we are prepared to understand the problem of communicating academic or subject matter meanings. The prospective

teacher can now see that teaching linear equations is not simply a question of logical step by step presentation with adequate provision for discussion and review, but also a problem in dealing with a personal-social-cultural matrix in which the academic communication is imbedded.

Learning theory and motivation then fall into place in explaining the dynamic process by which meanings are acquired and acted upon.

Measurement in education is introduced as a way of determining the meanings with which an individual comes to school, his learning context. It also helps us in assessing the new meanings which he acquires through the educational experience and his capacity for developing the more complex symbols. Life histories become important as an aid to understanding the socio-cultural meanings which a child brings to school. Sociograms and anecdotal records are presented as a means of gaining insight into their present social relations. The various achievement tests are treated in relation to the particular symbol ability or level that each assesses.

This approach to educational psychology which is built around communication theory as a theme allows us to view the whole child in action as in the individual psychological approach. In addition to this, more stress is placed upon the culture and the society in which he is developing. At the same time, by focusing throughout on the single theme of interaction which is mediated by symbols, a basis is indicated for logically integrating the contributions of the many fields upon which educational psychology draws. A final important advantage is that by concentrating on the actual symbols in real interaction processes, the work may be related to practical classroom situations at almost every step.

EVALUATION

Evaluating this course presented an interesting problem. If it were a matter of measuring student growth in subject matter alone, the procedure would have been clear. For that matter, a standardized short answer subject matter examination showed that the general knowledge of educational psychology gained was equal to that gained by students taught by the more traditional methods.

However, growth toward understanding how a whole individual learns in a whole environment could not be assessed so facilely.

This section of the article presents an attempt to use content analysis in measuring the attainment of this concept.[2]

A 1400-word short story was written describing two small boys from differing socio-economic strata and their experiences at home and at school. Here is a sample paragraph from the story:

> Mr. Walker (the teacher), who taught the sixth grade seemed always to be dressed in the same ill-fitting tweed suit. Secretly Matty wished Mr. Walker would like him. Yet, somehow, he was convinced that Mr. Walker's only purpose seemed to be in finding fault with him. Matty said that Mr. Walker was pretty mean. Matty's only contact with Stuart was to bitterly acuse him of being the teacher's pet. In fact, aside from accusing Stuart of that, he had little else to do with the boy and saw no reason to make friends with him. After all, they didn't do the same things.

The students were given the story to read at the beginning and end of the course. Each time they were asked to write seven hundred fifty words in answer to the question, "According to the story, what have the two boys learned? Cite specific evidence from the story."

The story was not discussed during the semester.

Each student essay was subjected to a content analysis in terms of cultural, social, psychological and academic learnings reported on the part of the boys. The first three are, of course, the traditional categories in which the social scientist analyzes the environment. The unit of analysis was any word, group of words or sentence which communicated a single meaning in terms of the four categories. Indices were set up for each content category. The student was scored one point for each index of learning that he recognized. It was assumed that the number of indices for all categories, reflected the extent to which the students realized that the boys were learning from their whole environment.

Students received credit for recognizing cultural indices if they wrote about the learning of values, symbols of status, life goals, way of life, etc. For example, a student would be credited with a cultural index if he said that the boys learned that the physical

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[2] Appreciation is expressed to Sanford Margolis for writing the story used in this evaluation and to Elizu Katz for acting as an independent judge in scoring the essays.

differences of their neighborhoods, as related in the story, symbolized differences in status. The social category included learnings about interpersonal relationships, social structure, rôles, authority situations, etc. A statement that the boys recognized the fact that they were members of different social classes would, for example, be an index. Credit for a psychological learning was given for such things as learning a self-concept, use of mechanisms of defense, etc. An illustration of this would be the statement that one of the boys learned to withdraw in the face of challenge. The academic category was restricted to the learning of the specific subject matter dealt with in the classroom situation which formed part of the story.

Students received credit only when the learnings which they reported were supported by citations from the content of the story.

An expert, who was trained in education and psychology, also performed this exercise in order to provide some notion as to the maximum number of indices that might theoretically be recognized for each category.

Table I summarizes the results of the content analysis.

A 't' test was performed to discover whether the differences in the number of indices observed at the beginning and end of the semester were significant. All differences proved significant at the .01 level except the academic which was little better than the .20 level. There may be two explanations for the low level of recognition of the academic indices. Firstly, the story did not emphasize the academic aspects of learning as evidenced by the small number in the report of the expert. Secondly, the previous training of these

TABLE I. MEAN NUMBER OF INDICES RECOGNIZED IN EACH CATEGORY AT THE BEGINNING AND THE END OF THE SEMESTER AND THE NUMBER RECOGNIZED BY AN EXPERT

N = 16 Students.

Category	Expert	Mean Student Score Before	Mean Student Score After	M_D
Cultural	60	7.6	18.1	10.5
Social	15	1.7	6.1	4.4
Psychological	43	6.9	18.7	11.8
Academic	10	0.8	1.5	0.7
Total	128	17.0	44.4	27.4

students had stressed the personality building aspects of education as part of the reaction against subject matter centered education.

Too much dependence cannot be placed on these figures however, because of the subjective element in scoring the student replies. An independent judge, who was trained in the content analysis of written communication, also scored the essays in order to provide a measure of reliability. The rank-order coefficient of correlation between the scores given by the author and those of the independent judge was .59.

In spite of its tentative nature, however, this evaluation lends weight to the hypothesis that thematic teaching of educational psychology in the context of communication theory can help students grow in their understanding that learning is the product of the interaction of a whole individual and his whole environment.

PREFERENCES IN COLORS AND ILLUSTRATIONS OF ELEMENTARY SCHOOL CHILDREN OF PUERTO RICO

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In 1945 the Superior Educational Council of the University of Puerto Rico made a study of the reading facilities available for the elementary school children of the Island. The results obtained determined the undertaking of a series of research projects, one of which was a study of the preferences in colors and illustrations for books of the elementary schools, as expressed in the choices of the students themselves.

In Puerto Rico the textbooks in reading have constituted a serious educational problem not only because of the fact that we never had enough for our large elementary school enrollment, but also because the majority of them are inadequate in their contents, vocabulary and physical make-up.

A large number of the books used in the schools of the Island were originally written in English for children of the continental United States. They reflect the life, play activities, amusements, customs, and interests of these children. Psychologically, in many respects, they do not represent the Puerto Rican child. Many of them depict human types, landscape, flora, and fauna different from ours. The interior decoration and the appliances shown in the houses that appear in these books are usually different, too, from those of our environment.

Even the books written by Puerto Rican authors for Puerto Rican children do not meet the requirements, especially in regard to gradation of vocabulary and illustrations. The Spanish American texts used in some grades are still less well adapted to our use.

The Superior Educational Council started from the premise that our differences in culture and geographical medium from the continental United States justify differences in the illustrations of our school textbooks. We do not mean isolationism in this, especially today, when great emphasis is placed on human and international relations, but heretofore books have been illustrated generally from the point of view of the artists and writers without paying much

attention to children's interests. The books used in our schools should reflect, of course, the life and geography of different parts of the world, but they should also take into consideration the realities of our native environment. Translations and adaptations of textbooks from other countries fulfilled their rôle in a time when they were the best that could be had. Henceforth our elementary school texts should interpret our ways of living and the influence which the external medium has exerted over us, without minimizing, of course, those themes and activities which are universally valid in the world of children.

A simple glance at the reading texts in our elementary schools reveals, besides the lack of adaptation to the environment already mentioned, many illustrations with poor color combinations, out of harmony with the light, colors, and tones of the tropical nature around us. Furthermore, many drawings have little artistic merit, and no uniformity whatsoever in regard to the number of illustrations used and the disposition of these illustrations on the pages.

These limitations made us think that a study of the preferences and dislikes of the Puerto Rican child in respect to colors, types of illustrations, and the position of these illustrations in relation to the text matter would undoubtedly help to better the quality of the books intended for our elementary schools.

AIMS

Accordingly we proposed to carry out research which would help us to determine:

1) The colors that our school children prefer for the covers and pictures of their reading books.

2) The types of illustrations they prefer for their books.

3) The part of the page where they wish the illustration to appear.

PREVIOUS RESEARCH

Neither the theme of the study nor the procedure employed has any claim to originality. In fact, in our research we came across fifteen or more studies carried on in the United States with similar aims and procedures. However, our study represents the first attempt to interpret with objectivity the preferences of the elementary school children of Puerto Rico in the items we wished to

investigate. As far as we know, this is, too, the first study of its kind carried on in the Spanish-speaking countries.

SUBJECTS AND MATERIALS FOR THE EXPERIMENT

A representative sample of 2496 elementary school pupils was obtained. It included boys and girls of Grades II, IV and VI from both the urban and the rural zones. The different geographical, industrial, and agricultural areas of the Island were taken into consideration in the selection of the sample.

The materials for the experiment included:

A) For the color preferences:

1) Three cards 7″ x 9″, painted uniformly in a brilliant tone of equal intensity for each of the primary colors (red, yellow, blue), and another set of three similarly painted cards for each of the secondary colors (green, orange and violet). From these the students selected their favorite colors.

2) Thirty cards 7″ x 9″, for five tones of each of these six colors. The students were to select their favorite tone of the color already selected in (1). The five tones to be exhibited were: very light, light, normal, dark, and very dark.

3) Fifteen bichromatic combinations obtained with the six fundamental colors, in cards of size 14″ x 9″.

4) Twenty trichromatic combinations obtained with the six fundamental colors, in cards of size 18″ x 9″. In both (3) and (4) the pupils had to select their favorite combination.

B) For the different types of drawings:

Three drawings in ink, on white cardboard, 11″ x 8″. The subject of the three drawings was the same: the entrance door to a walled garden. One of the drawings was lineal, very schematic. Another was done in black and white areas. The third one was normal or realistic, a complete gradation of light and shadow, obtained with fine parallel and crossed lines and pen point work in black ink.

C) For the position of the illustrations:

We used ten white cards, each 7″ x 9″, containing a space in black to represent the actual size and the possible place of the illustration on the page. The spaces in black varied in size, from

one-fourth page to a full page, and occupied different positions on the card.

Each card (for color, drawings, and position of the illustration) was assigned a key number to facilitate the handling of the material and the tabulation of the data.

In each school chosen for the experiment the students were picked at random and assembled in a room. The purpose of the experiment was explained to them and their personal data were recorded on a mimeographed questionnaire. The materials to be used were exposed in another room which had been previously equipped for that purpose. The students were sent to this room one at a time. They made their selections of color, type of drawing, and position of the illustration on the page, following the directions given by the persons in charge of the experiment.

The data were tabulated and analyzed.

GENERAL CONCLUSIONS

A) Monochromatic preferences:

1) Blue was the favorite color throughout all grades, ages (except 7), sexes and zones. Forty-two per cent of the 2496 students tested preferred it. This color was a stronger favorite with the older children than with the younger ones. Orange, on the other hand, was the least popular. Only 7.5 per cent of the tallies belong to it.

2) Red and yellow, in the order mentioned, came next in preference. These colors obtained 18.9 per cent and 14.4 per cent of the tallies, respectively.

3) Among the 108 seven-year old pupils red was the favorite color, with 27.8 per cent of these pupils voting for it. Blue, the next favorite for this age, obtained 25 per cent, while green, the least favored, obtained 4.6 per cent.

4) Primary colors were preferred to secondary colors. Green, violet and orange obtained 8.9 per cent, 8.3 per cent, and 7.5 per cent of the tallies, respectively.

5) The percentage of students who selected red, yellow and violet diminished with the advancement in grade. For red, the percentages were 19.8 per cent, 19.2 per cent and 17.7 per cent for Grades II, IV, and VI, respectively; for yellow, 17.1 per cent, 14.3 per cent and 11.8 per cent for the same grades in the same

order; for violet, 11.9 per cent, 10.0 per cent and 3.0 per cent in the same way.

6) The children from the rural zone showed a more decided preference for blue and red than the children from the urban zone (44.7 per cent for blue and 20.5 per cent for red in the rural zone, against 39.3 per cent for blue and 17.3 per cent for red in the urban zone). The reverse was true with yellow and orange (12.2 per cent for yellow and 5.4 per cent for orange in the rural zone, against 16.6 per cent for yellow and 9.6 per cent for orange in the urban zone).

B) Tones

1. The dark tone of each color was the favorite one.

2) The order of preference was the same in the three grades: dark, (35.7 per cent); normal, (23.4 per cent); light (21.5 per cent); very light (12.5 per cent); and very dark (6.9 per cent). The figures in parentheses indicate the per cent of 2496 students selecting each tone.

This same order prevailed throughout all ages (except for the youngest and the oldest children), sexes and zones. Very dark tones were, as a rule, rejected.

C) Bichromatic combinations

Blue-red was the bichromatic combination best liked, in general, by both boys and girls. It was, likewise, the first choice of the urban zone and the second choice of the rural zone, where blue-violet superseded it by 0.2 per cent. Nine-year olds and second-graders also preferred blue-violet. Orange-yellow, yellow-red, and red-green were the respective preferences of six-, seven- and eight-year olds. No general statement could be made regarding the bichromatic preferences by ages, except that the choices were rather erratic. The percentage range of preferences extended from 1.5 per cent (orange-violet, the least liked) to 14.6 per cent (blue-red, the most popular). The largest per cent difference between any two consecutive bichromatic combinations when arranged in descending order of preference, was 3.0, which came precisely between the best liked and the next favorite (blue-violet, 11.6 per cent).

D) Trichromatic combinations

Here the range of preference, expressed in per cent of the total number of students, extended from 1.5 (orange-green-violet, the

least popular) to 10.3 (orange-blue-yellow, the best liked). When arranged in descending order of preference the differences between the consecutive percentages were small and rather smoothly distributed. The mode of the arrangement is 0.1 per cent, which occurred in five cases out of nineteen. The largest difference (2.2 per cent) came between the second and the third best liked combinations, 9.4 per cent and 7.2 per cent, for blue-vellow-red and blue-red-green, respectively.

The favorite trichromatic combination for the girls was blue-yellow-red; for the boys it was blue-yellow-orange. This combination was the girls' second choice, with a difference of only 0.5 per cent between it and their first choice. In both the urban and the rural zones, and in Grades II and IV, blue-yellow-orange was the preferred combination. In Grade VI blue-yellow-red was the first choice. The selections made by students of ages eleven, thirteen, fifteen, sixteen and seventeen (the oldest) departed from the general pattern of choices. No inclusive statement can be made for all of them.

TYPES OF ILLUSTRATIONS AND POSITION

The drawing with the most realistic approach to the theme (the complete gradation type) was by far the most popular in all grades, sexes and zones, and in almost all ages.

Those illustrations occupying either a full page or the upper half of the page had the approval of the students of all grades, sexes and zones, and nearly all ages.

CONCLUSIONS AND RECOMMENDATIONS

The analysis of the data gathered in the study reveals aesthetic concepts which possibly reflect the power of cultural influences on the Puerto Rican child, the sensibility awakened in him by the light and chromatic contrasts of a tropical environment, and the real and vicarious experiences he has lived. The choices made by the children may have been conditioned, too, by such factors as race, temperament, and physical and emotional state.

In general, neither age, sex, nor zone—urban or rural—influenced the elementary school children who participated in this experiment in their selection of colors, types of drawings or the place where the illustrations should appear on the page.

On the light of the findings of this research project the following recommendations are made with the aim of helping the persons

who are interested in writing or buying textbooks for the children of Puerto Rico. School administrators and parents who frequently face the problem of selecting adequate books for children, may profit by them, too.

1) Covers for the books intended for the primary grades should be done in a rich tone of blue or red. The books assigned to the higher grades of the elementary school may have covers with blue, green or yellow as the main color.

Elementary school children will like, also, bichromatic covers in blue-red, blue-violet and blue-yellow. If three colors are preferred for the covers, those which will most likely meet the highest approval are blue-orange-yellow, blue-red-yellow, and blue-red-green.

2) Illustrations should be as life-like as possible, and in the favorite colors of children. These illustrations should occupy either a full page, or the upper half of the page. They should not divide or interrupt the printed part of the page.

Since the interests and preferences of children, including their interest in color and drawing, may be subject to change, they should be reëvaluated from time to time. These interests cannot by themselves be used as an absolute criterion in the preparation of reading textbooks. It is, of course, realized that other needs of children, the interests of society, and the opinion of experts should be taken in consideration as a counter-weight to the children's own subjective judgment.

PERCEPTUAL RETARDATION IN READING DISABILITY CASES

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The importance of inadequate reading readiness as an agent in reading disability has been well established. However there are a number of factors which go to make up the complex called reading readiness. Some of these, such as mental age, have been systematically studied and their rôle in reading disability pretty well delineated. Other factors, such as perception, have received little experimental attention although their importance is generally agreed upon in the literature (*2*, *3*). Harris (*3*), for example, observes: "Even if the eyes are normal, the child may have immature visual perception. Seeing a thing does not always mean noticing its details. Many young children pay attention only to the main characteristics of visual stimuli—the size, shape, and color—and ignore the details. When asked to match letters or words they make many errors, not because of faulty vision, but because they do not notice differences which are obvious to older children." (p. 29)

Implicit in such a statement is the assumption that perception has its own course and sequence of ontogenetic development. Gestalt psychologists have long maintained that this is so, and that such a development can best be described by the sequence: perception of the crude whole, differentiation of details, and integration of the differentiated parts into an articulated whole. In this connection Townsend (*6*) was able to point to some important trends in the maturational unfolding of the perceptual process. In an extended study of the factors which enter into the ability of copying, he came to the conclusion that copying is largely a function of perceptual ability, much more so than a function of motor skills. Between the mental ages of five to seven years, he found a rapid and regular increase in the reproduction of two aspects of figures; namely, components and essential form. By components he meant that all outstanding part aspects of a figure be depicted; for example, when copying a rectangle all four sides should be repre-

sented in the drawing. By essential form he meant that prominent shape characteristics of parts of figures be represented in the drawing; this implies, for example, that a small circle not be represented as a dot. It is evident, that this increase in components and essential form with mental age is one confirmation and exemplification of the Gestalt notion of differentiation.

The present study is an investigation of the gross development of visual perception in a group of reading disability cases. It is postulated that retardation in perceptual development is one important factor which enters into reading disability and that, consequently, this group of reading disability cases will be significantly inferior in the performance of perceptual tasks in comparison with a peer group which does not show any reading disability.

PROCEDURE

The subjects chosen for the present study represented a random sampling of forty male reading disability cases in attendance at the Clinical School of the University of California at Los Angeles. The subjects ranged in age from eight to forty-six years, of whom thirty-three were under thirteen years of age. All of the subjects were of average or better intelligence and free of disabling emotional or physical handicaps.

The non-verbal part of the Alpha Test of the Otis Quick-Scoring tests was chosen for the present investigation because it relies so heavily on perceptual factors. It consists of one hundred items of four pictures each. Three of these four pictures have one major aspect in common, while the fourth is different. The testee is instructed to draw a line through the one which is different. This test, therefore, requires sufficient perceptual discrimination to select a commonalty and to constitute a difference. While the more geometrical figures rely more heavily on perceptual discrimination (as, for example, in the four five-pointed stars, three of which have a dot on four points, while the fourth star has a dot on only three points—item 54, Form B), there are a number of items which depend to a greater extent on higher-order abstraction and concept formation. This is particularly true of some items which depict concrete objects. Item 62 (Form B), for example, depicts a clock, a ruler, a thermometer, and a pressing iron. The higher-order abstraction, 'measuring instrument', must be made before the item

can be successfully solved. However, most of the concrete items do not appear to be as heavily loaded with higher-order concept formation as this one. Unfortunately, there are also a few items which require the ability to read figures and to do simple additions. However, most items require perceptual discrimination of what Townsend has called components and essential form. The over-all impression one gets is that the non-verbal part of the Otis Alpha is a fairly adequate instrument for the measurement of perceptual development, at least from the point of view of face validity.

By means of a table of age norms published in the Otis *Manual of Directions* (*5*) the point scores of the subjects were converted into age scores. The age score thus obtained, the mental age, is considered in this study to be representative of the perceptual age of the subject. If these reading disability cases are retarded in their perceptual development, then they should score on this test below the median for their age, and thus obtain a mental age below their chronological age. Such retardation gains in significance when we realize that the sample studied was selected from the upper half of the distribution of general intelligence. Furthermore, if we subtract the obtained mental age from the chronological age, we obtain an index of retardation. If, on the other hand, these pupils are not perceptually retarded, then the retardation index should be zero or negative.

In order to demonstrate that the results are not a function of a low level of intelligence, a perceptual-intellective lag index was computed. This index was obtained by subtracting the Otis Alpha MA from the MA obtained by other sources, specifically the Stanford-Binet, Wechsler-Bellevue (adult form), or WISC.

If perceptual retardation is found, then a positive perceptual-intellective index will demonstrate that it is not a function of the level of development of general intelligence, while a zero or negative perceptual-intellective lag index indicates that the perceptual retardation could be a function of the development of general intelligence.

RESULTS

The results obtained for the thirty-three children are shown in Table 1. They show that these children, as a group, are almost a year retarded in perceptual development when compared with

TABLE 1.—MEAN VALUES OF CHRONOLOGICAL AND MENTAL AGE, PERCEPTUAL RETARDATION, AND PERCEPTUAL-INTELLECTIVE LAG OF 33 CHILDREN WITH READING DISABILITY (COLUMNS 1, 3, 4, 5, 6 IN YEARS, COLUMN 2 IN POINT SCORES)

	1 CA	2 Otis Score	3 Otis MA	4 Retardation (MA-CA)	5 Other MA*	6 Perceptual Intellective lag (MA-OtisMA)
Mean	9.92	53.7	8.96*	.96	11.2	2.24
Standard error of mean				.31		.58
+				3.1		3.9
P				<1.0%		<1.0%

* Since a number of children had WISC or Wechsler IQ's, this mean is approximate, as the MA was estimated by $MA = \frac{IQ}{CA.}$

† This mean contains one estimated MA. Otis norms have been established only up to age 12–11, equivalent to a score of 72. The MA of one child who obtained a score of 74 was estimated at 14-0.

their age peer group. This mean retardation is significant beyond the .01 level of confidence.[1] That this result is not a function of the development of general intelligence is shown by the fact that the perceptual-intellective lag index is positive. This index reveals that the perceptual development of this group lags approximately two and a quarter years behind the development of general intelligence. This mean lag is also significant beyond the .01 level of confidence.

Of the thirty-three children, twenty-seven were perceptually retarded, the retardation ranging from one to forty-six months. On the other hand, six of these children were advanced beyond their age in their perceptual development, the advance ranging from one to fifty-four months.

While fifteen perceptually retarded children between the CA of 8-0 to 9-4 show a mean retardation of eleven months, twelve of the perceptually retarded children between the ages of 10-2 and 12-8 have a mean retardation of thirty-two months. This finding could indicate that perceptual retardation is cumulative.

[1] The means of Columns 1 and 3, as well as 3 and 5, were not directly compared because in such comparison age has to be partialled out. The method of the computation of a retardation and lag index avoids the necessity of computing a correlation coefficient.

Of the seven adults, ranging in age from thirteen to forty-six years, four were found to be perceptually retarded from nine to fifty-nine months, although their IQ's ranged from 98 to 106, with a median of 104. The other three were perceptually at least at par. They achieved scores higher than those for which age norms are available.

DISCUSSION

The fact that twenty of the forty subjects were retarded ten or more months in perceptual development would appear to be a very significant finding. It is reasonable to assume that such a marked degree of perceptual retardation would have a significant bearing on the reading disability of these subjects. However, this generalization cannot be extended to the entire group since a minority of subjects not only showed no retardation in perceptual development but considerable advance beyond their age. It would be futile to ascribe functional significance to perceptual factors in these reading disability cases—rather we must look for other factors.

A further trend which is indicated in the present data is that perceptual retardation is cumulative through the childhood age group; that is, the older the children get chronologically, the more retarded they become in relation to their ages. However, this trend does not appear to carry through into adulthood. Although there are too few adult cases to make any definite statements, it does appear that perceptual retardation plays a more significant rôle in the reading disability of children than in that of adults.

The question may be raised at this point as to what condition or conditions bring about a retardation in perceptual development in these subjects. Although formal evidence on this point is scanty, there are certain clinical impressions which may serve as helpful hints for further research: (a) Some children seem to be so absorbed in one specific interest, e.g., airplanes, chemistry, that they pay little attention to other normal objects of interest in their environment. Such an over-focussed interest in one area might well lead to an unequal differentiation of the perceptual field in which a small area becomes highly differentiated while other areas of the field remain relatively unstructured or undifferentiated. (b) Not infrequently children are observed who have been negatively conditioned to areas of perceptual discrimination. Here we usually find ambitious parents who put a great deal of pressure on their

children to learn to read before they have reached a stage of reading readiness in which they can make the fine form discriminations essential to reading. The result is a state of anxious helplessness similar to what Goldstein calls 'catastrophic reaction' accompanied by avoidance reactions to such required perceptual discriminations. (c) In a number of these reading disability cases the concept of distinct perceptual types may be of value. There is considerable evidence for what we may term visual and haptic types (Lowenfeld *4*, Fernald *1*). The visual type uses his eyes as a mediator between himself and reality, while the haptic type relates to reality primarily through contact and kinesthetic sensations. When the emphasis in learning to read is exclusively on visual experiences without concomitant tactile and kinesthetic sensations, the haptic child may be at a distinct disadvantage. (d) Finally, there are a variety of emotional and personality factors which may enter into perceptual retardation. Children suffering from severe emotional conflicts and frustrations may be so chronically anxious that general learning and perceptual differentiation are adversely affected. Or such a child may focus his energies inward in self-preoccupation with his problems or in compensatory fantasies which interfere with his normal perceptual growth. It is interesting to note that Vorhaus (*7*) emphasizes such personality constellations in her study of personality patterns among non-readers.

Finally, this preliminary investigation would appear to have some implications for the symptomatic treatment of reading disability cases. It is evident that a majority of these cases can profit from remedial instruction directed toward the better differentiation and integration of perceptual experiences. It is also evident that there is a substantial minority of cases whose reading disability will not be materially improved by this type of instruction.

SUMMARY

This study dealt with the hypothesized relationship between perceptual retardation and reading disability in subjects with average or above average intelligence. It was found that in this group of reading disability cases:

1) A majority of these subjects were found to be markedly retarded in perceptual development.

2) Perceptual development lagged significantly behind the development of general intelligence in a majority of subjects.

3) A minority of subjects were average or above in perceptual development.

4) Retardation in perceptual differentiation was cumulative with age.

5) Perceptual retardation was a significant factor in reading disability.

The possible value of training in perceptual differentiation as symptomatic treatment for reading disability is suggested.

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